CLAIMS

1. A dual-gate field effect transistor comprising a substrate, a source, a drain, a vertical channel provided between the source and the drain as rising from the substrate, a pair of gate insulation films sandwiching the channel from a direction orthogonal to a carrier-running direction in the channel and a pair of gate electrodes facing the channel, respectively, via the pair of gate insulation films, wherein the pair of insulation films have different thicknesses.

2. A dual-gate field effect transistor according to claim 1, wherein the pair of gate electrodes are electrically connected to each other.

3. A dual-gate field effect transistor according to claim 1, wherein the pair of gate electrodes are electrically independent of each other.

4. A dual-gate field effect transistor according to claim 1, wherein the pair of gate insulation films have different permittivities.

5. A dual-gate field effect transistor according to claim 1, wherein the pair of gate electrodes have different work functions.

6 A dual-gate field effect transistor according to claim 1, wherein the vertical channel has a triangle shape in cross section in the direction orthogonal to the carrier-running direction and wherein the pair of gate insulation films are in contact with slant faces that are opposed sides of the triangle, respectively.

7. A dual-gate field effect transistor comprising a substrate, a source, a drain, a vertical channel provided between the source and the drain as rising from the substrate, a pair of gate insulation films sandwiching the channel from a direction orthogonal to a carrier-running direction in the channel and a pair of gate electrodes facing the channel, respectively, via the pair of gate insulation films, wherein the pair of insulation films have different permittivities.

8. A dual-gate field effect transistor according to claim 7, wherein the pair of gate electrodes are electrically connected to each other.

9. A dual-gate field effect transistor according to claim 7, wherein the pair of gate electrodes are electrically independent of each other.

10. A dual-gate field effect transistor according to claim 7, wherein the pair of gate electrodes have different work functions.

11. A dual-gate field effect transistor according to claim 7, wherein the vertical channel has a triangle shape in cross section in the direction orthogonal to the carrier-running direction and wherein the pair of gate insulation films are in contact with slant faces that are opposed sides of the triangle, respectively.

12. A dual-gate field effect transistor comprising a substrate, a source, a drain, a vertical channel provided between the source and the drain as rising from the substrate, a pair of gate insulation films sandwiching the channel from a direction orthogonal to a carrier-running direction in the channel and a pair of gate electrodes facing the channel, respectively, via the pair of gate insulation films, wherein the pair of gate electrodes have different work functions.

13. A dual-gate field effect transistor according to claim 12, wherein the pair of gate electrodes are electrically connected to each other.

14. A dual-gate field effect transistor according to claim 12, wherein the pair of gate electrodes are electrically independent of each other.

15. A dual-gate field effect transistor according to claim 12, wherein the vertical channel has a triangle shape in cross section in the direction orthogonal to the carrier-running direction and wherein the pair of gate insulation films are in contact with slant faces that are opposed sides of the triangle, respectively.